

5,631,677 (hereafter referred to as "the Horigome patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Independent claims 1 and 11 are not anticipated by the Horigome patent because the Horigome patent does not disclose a control section that performs print-operation-control such that a remaining-battery-capacity detector is used to detect a remaining-battery-capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation-commencement specification received from said print-operation-commencement specifying section, and that performs print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to a specified print-operation-commencement, the remaining-battery-capacity detector is used to detect the remaining-battery-capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper. Claims 1 and 11 are reprinted below with these features depicted in bold type-face:

1. A printer comprising:
 - a printing section for performing printing on paper;
 - a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;
 - a battery power source;
 - a remaining-battery-capacity

detector for detecting a remaining-battery-capacity level of said battery power source;

a print-operation-commencement specifying section for specifying print-operation commencement; and

control section for performing print-operation control, wherein,

said control section performs the print-operation control such that said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation commencement specification received from said print-operation-commencement specifying section; and

said control section performs the print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to said print-operation commencement specification, said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper.

[Emphasis added.]

11. A printer comprising:

a printing section for performing printing on paper;

a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;

a remaining-battery-capacity detector for detecting a remaining-battery-capacity level of a battery power source;

a print-operation-commencement specifying section for specifying

print-operation commencement; and
a control section
wherein,
said control section performs
print-operation control based on the
remaining battery capacity level
detected by said remaining-battery-
capacity detector immediately before a
paper transfer operation is commenced
for the first sheet of the paper for a
print operation which is commenced
corresponding to a print-operation
commencement specification received
from said print-operation-commencement
specifying section; and
when printing is consecutively
performed on a plurality of sheets of
the paper corresponding to said print-
operation commencement specification,
said control section performs print-
operation control based on the detected
remaining battery capacity level
immediately before the paper transfer
operation is performed for the print
operation for each of the plurality of
sheets of the paper. [Emphasis added.]

These features will be addressed below.

The Horigome patent proposes a two-stage control procedure. (See, e.g., column 9, lines 11-19.) In this procedure, the capacity of a battery is sensed during printing, whenever a line is printed, and more specifically, when a carriage motor is being decelerated. (See, e.g., column 9, lines 13-16.) In a first stage, when the battery is partially depleted, the driving of the carriage motor and paper-feed motor are controlled so as not to overlap. In the second stage, if the battery capacity becomes dangerously low, low-power error processing is performed. More specifically, an off-line state is established, the carriage is returned to its home

position and the printing head is capped. As can be appreciated from the foregoing, in the Horigome patent, battery capacity checks occur after a sheet has already been transferred to a printing section -- namely during the printing of each line when a carriage motor is decelerated.

The Examiner has nonetheless maintained this ground of rejection, arguing that the Horigome patent discloses monitoring the battery capacity at all times during a printing operation, and that therefore, it monitors before each sheet of paper is transferred, citing column 6, lines 36-40 of the Horigome patent. (See Paper No. 8, page 7.) This position is flawed in two ways. First, it ignores claim language. Second, it mischaracterizes the operations taught by the Horigome patent. Each of these flaws is discussed below.

First, even assuming, arguendo, that the Horigome patent did teach monitoring battery capacity at all times during a printing operation, such printing operations occur after a sheet has already been transferred. For example, the Horigome patent states "... a desired image is printed on the recording surface of the recording medium, which has been conveyed to a platen 35 from a paper-feed unit 34. [Emphasis added.]" Column 5, lines 38-40. Paper transfer before printing is not to be confused with paper feed during printing. For example, the specification of the present invention states:

According to the control, the paper-feed motor 29 is driven via the paper-feed motor driver 28 so that paper is drawn out of the paper cassette 5 and is then transferred to a predetermined paper transfer path. In

addition, the microcomputer 15 performs control such that the thermal-head motor 31 is driven via the thermal-head motor driver 30, and the thermal head 38 is thereby closely engaged with the platen roller (not shown) in such a manner that the paper and the inked ribbon are sandwiched therebetween.

The compressed image data specified for printing is read out of the SDRAM 22. Then, the image data is converted by the JPEG decoder 39 and the image-scaling circuit 40 to a print signal. Then, the print signal is temporarily stored in the SRAM 41.

Subsequently, the paper-feed motor 29 and the inked-ribbon motor 33 are driven to transfer the paper and the inked ribbon in the state where they are sandwiched between the thermal head 38 and the platen roller.

Concurrently, according to the compressed image data specified for printing, the thermal-head controller 37 performs supply control for the heating power that is supplied from the power controller 13 through the head power feed line 42. Then, an image according to the image data is printed on the paper. [Emphasis added.]

(Page 18, line 11 through page 19, line 9) The specification of the present application also states:

if the currently remaining power capacity of the DC battery 12 is lower than the predetermined value, that is, if **transfer and printing** for one sheet of the paper which are performed subsequent to the detection of the remaining capacity level of the DC battery 12 cannot be completed with the currently remaining power capacity ...
[Emphasis added.]

(Page 22, line 22 through page 23, line 2.) As can be appreciated, in both the present invention and the Horigome patent, paper transfer occurs before printing and paper feeding associated with printing. Monitoring battery capacity during printing is not the same as monitoring battery capacity before paper transfer, which itself occurs before printing. Accordingly, claims 1 and 11 are not anticipated by the Horigome patent for at least this reason. Since claims 2-10 depend, either directly or indirectly, from claim 1, and since claims 13-20 depend, either directly or indirectly, from claim 11, these claims are similarly not anticipated by the Horigome patent.

Second, by taking one phrase of the Horigome patent out of context, the Examiner mischaracterizes the operations taught by the Horigome patent. The Examiner quotes lines 36-38 of Column 6 of the Horigome patent which state, "... battery capacity during the printing operation is monitored at all times" (Emphasis added.) However, later in the same paragraph, the Horigome patent states:

To this end, it is necessary during the printing operation to detect the battery voltage in an interval of time in which the drop in battery voltage is largest [Emphasis added.]

Column 6, lines 41-43, and further states:

In this embodiment, therefore, sensing of battery capacity is performed in synchronization with deceleration pulses of the carriage motor 8. [Emphasis added.]

Column 6, lines 50-53. The Horigome patent also states:

The control procedure during a printing operation will now be described with reference to FIGS. 6A, 6B and 7.

In short, this processing involves sensing the capacity of the battery 20 during printing, this being performed one time, whenever one line is printed, while the carriage motor 8 is being decelerated. [Emphasis added.]

Column 9, lines 11-16. Thus, the Horigome patent is using the term "monitoring" to mean something different than "detecting" (which is the term used in the claims) or "sensing". According, claims 1 and 11 are not anticipated by the Horigome patent for at least this additional reason. Since claims 2-10 depend, either directly or indirectly, from claim 1, and since claims 13-20 depend, either directly or indirectly, from claim 11, these claims are similarly not anticipated by the Horigome patent.

To summarize, the present invention detects a battery capacity before each sheet is transferred, not at a particular time after printing has already commenced. Thus, if a print job is for a number (N) of sheets, but there is only sufficient battery capacity to complete less than the full number (N) of sheets, the present invention will print a part of the print job until it cannot complete another sheet. None of the prior art references teach this feature.

With regard to dependent claims 3 and 13, these claims recite that the battery capacity level is checked to see if at least one sheet of paper can be transferred and

printed. The levels checked by the Horigome patent (whether carriage and paper feed motors be driven simultaneously, and, apparently, whether the printer in danger of not being able to complete another line and recap ink jet head) are different. Claims 4 and 14, which depend from claims 3 and 13, respectively, further specify not commencing a paper transfer operation in the event that the sheet cannot be transferred and printed. Accordingly, these claims are not anticipated by the Horigome patent for these further reasons.

With regard to dependent claims 7 and 17, and claims 8 and 18 which depend, respectively, therefrom, a partial number of sheets can be printed. In the second embodiment of the Horigome patent in which a battery capacity is checked during the charging of a battery, the charging is stopped only when all of the desired number of sheets can be printed. Accordingly, these claims are not anticipated by the Horigome patent for this further reason.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 2 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 1 and 11 above) in view of U.S. Patent No. 6,067,101 (hereafter referred to as "the Arakawa patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a removable battery source, but relies on the Arakawa patent as teaching such a removable battery

source. (See, Paper No. 5, page 5.) Even assuming, arguendo, that the Arakawa patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 1 and 11, set forth above. Since claims 2 and 12 depend from claims 1 and 11, respectively, they are not rendered obvious by the Horigome and Arakawa patents for at least this reason.

Claims 10 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 3 and 13 above) in view of U.S. Patent No. 6,247,777 (hereafter referred to as "the Shimoda patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a temperature dependent battery capacity determination, but relies on the Shimoda patent as teaching such a test. (See, Paper No. 5, page 6.) Even assuming, arguendo, that the Shimoda patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 3 and 13, set forth above. Since claims 10 and 20 depend from claims 3 and 13, respectively, they are not rendered obvious by the Horigome and Shimoda patents for at least this reason.

Moreover the Shimoda patent teaches checking temperature to (i) prevent failure of ink discharge (See, e.g., column 2, lines 11-17.), and (ii) prevent head deformation (See, e.g., column 2, lines 38-43.) That is, the Shimoda patent is concerned with head print failure, not the dependency of battery capacity on temperature.


Therefore, there is no suggestion to combine the references as proposed by the Examiner. Accordingly, claims 10 and 20 are not rendered obvious by the Horigome and Shimoda patents for at least this additional reason

Conclusion

In view of the foregoing amendments and remarks, the applicant respectfully submits that the pending claims are in condition for allowance. Accordingly, the applicant requests that the Examiner pass this application to issue.

Respectfully submitted,

April 17, 2003

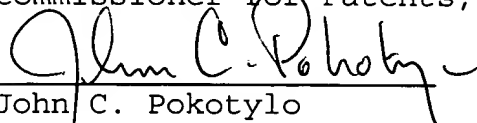

John C. Pokotylo, Attorney
Reg. No. 36,242
Customer No. 26479
(732) 335-1222

732-542-9070

STRAUB & POKOTYLO
1 Bethany Road
Suite 83
Hazlet, NJ 07730

CERTIFICATE OF MAILING under 37 C.F.R. 1.8(a)

I hereby certify that this correspondence is being deposited on **April 17, 2003** with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.


John C. Pokotylo

Reg. No. 36,242